

WHAT IS CLAIMED IS:

1. An apparatus for processing a semiconductor substrate, comprising a substrate holder comprising a support element configured to support a substrate of a particular size in a support plane defined by the support element, wherein the support element comprises an annular veined ring supporting an outer edge of the substrate when the substrate is supported on the support element.
2. The apparatus of Claim 1, wherein the support element comprises at least 300 veins.
3. The apparatus of Claim 1, further comprising a first annular groove on the substrate holder, the first annular groove being positioned radially inward from the support element.
4. The apparatus of Claim 3, wherein the first annular groove has a generally uniform annular thickness.
5. The apparatus of Claim 3, wherein the substrate holder further comprises a substrate pocket and the first annular groove is formed such that the first annular groove is lower than a surface of the substrate pocket.
6. The apparatus of Claim 3, further comprising a second annular groove on the substrate holder, the second annular groove being positioned radially outward from the support element.
7. The apparatus of Claim 6, wherein a vertical depth of the first annular groove is greater than a vertical depth of the second annular groove.
8. The apparatus of Claim 5, further comprising an annular ring raised above the substrate pocket and positioned radially inward of the support element.

9. The apparatus of Claim 1, wherein the substrate holder is configured to be supported by a spider structure comprising a vertical shaft and at least three substrate holder supporters extending radially outward and upward from the shaft, the substrate holder supporters configured to support the bottom surface of the substrate holder.

10. The apparatus of Claim 9, wherein the bottom surface of the substrate holder includes a recess configured to receive upper ends of the substrate holder supporters of the spider structure.

11. The apparatus of Claim 9, wherein the bottom surface of the substrate holder includes a circular groove centered about a central vertical axis of the substrate holder, the circular groove configured to receive upper ends of the substrate holder supporters of the spider structure, the circular groove of the bottom surface being interrupted in one location.

12. An apparatus for processing a substrate, comprising:

a reaction chamber;

a plurality of radiant heating elements configured to heat the reaction chamber; and

a substrate holder in the reaction chamber, the substrate holder having a plurality of support elements configured to support a substrate of a particular size within a support plane defined by the plurality of support elements, wherein the support elements comprise a plurality of spaced veins configured in an annular ring to support an outer edge of the substrate.

13. The apparatus of Claim 12, wherein the substrate holder further comprises:

a substrate pocket; and

an annular groove formed in the substrate pocket and configured to surround an outer edge of the substrate when the substrate is supported on the plurality support elements.

14. The apparatus of Claim 12, wherein the support plane is formed by top surfaces of the plurality of spaced veins.

15. The apparatus of Claim 13, further comprising an annular recess in the substrate pocket, the annular recess positioned radially inward of the support elements.

16. The apparatus of Claim 12, further comprising a support structure configured to support the substrate holder, the support structure comprising a vertical shaft and a plurality of support arms extending generally radially outward and upward from the shaft, the support arms having upper ends configured to support the substrate holder.

17. The apparatus of Claim 13, further comprising an annular ring on the substrate holder, the annular ring being positioned radially inward of the support elements and having a raised surface higher than a surface of the substrate pocket but no higher than the support plane.

18. An apparatus for processing a substrate, comprising a susceptor having a support surface sized to support a substrate of a particular size in a support plane, wherein the support plane is formed by top surfaces of a plurality of veins.

19. The apparatus of Claim 18, wherein the plurality of veins are formed in an annular ring to support an outer edge of the substrate.

20. The apparatus of Claim 19, further comprising a plurality of annular recesses in the susceptor, wherein a first of the plurality of recesses is positioned radially outward of the plurality of veins and a second of the plurality of recesses is positioned radially inward of the plurality of veins.

21. The apparatus of Claim 18, further comprising an annular ring on the susceptor, the annular ring being positioned radially inward of the plurality of veins and having a raised surface no higher than the support plane.

22. The apparatus of Claim 20, further comprising an annular ring on the susceptor, the annular ring being positioned radially inward of the second of the plurality of recesses and having a raised surface no higher than the support plane

23. A method of manufacturing an apparatus for processing a substrate, comprising:

forming a substrate holder out of graphite, the substrate holder having one or more support elements configured to support a substrate of a particular size in a support plane defined by the one or more support elements, wherein the one or more support elements comprise a plurality of veins configured on an annular ring to support an outer edge of the substrate when the substrate is supported on the one or more support elements;

forming a first annular groove in the substrate holder, the first annular groove configured to surround an outer edge of the substrate when the substrate is supported on the one or more support elements;

forming a second annular groove in the substrate holder, the second annular groove being positioned radially inward of the one or more support elements; and

coating the substrate holder with SiC.

24. The method of Claim 23, further comprising forming a raised annular ring positioned radially inward of the second annular groove.

25. The method of Claim 24, wherein a top surface of the raised annular ring is no higher than a top surface of support plane.

26. The method of Claim 23, further comprising forming a spider structure configured to support the substrate holder, the spider structure comprising a vertical shaft and at least three substrate holder supporters extending radially outward and upward from the shaft, the substrate holder supporters configured to support the bottom surface of the substrate holder